

EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS  
ON THE CHEROKEE NATIONAL FOREST, TENNESSEE

By

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## INTRODUCTION

Aerial sketchmap and ground surveys were conducted on the Tellico, Nolichucky and Unaka Ranger Districts, Cherokee National Forest in August 1976. This evaluation covered a total of 122,322 acres of the Tellico District, 75,393 acres of the Nolichucky District and 102,190 acres of the Unaka District (Figs. 1 & 2).

These infestations are part of a southwide outbreak involving all 13 of the states in the southeastern area. Results of this evaluation indicate that the outbreak on the Tellico District has increased considerably, however, the current infestations are localized in the upper Tellico and North River drainage. The outbreaks on the Nolichucky and Unaka Districts have continued at about the same level as in the summer of 1975.

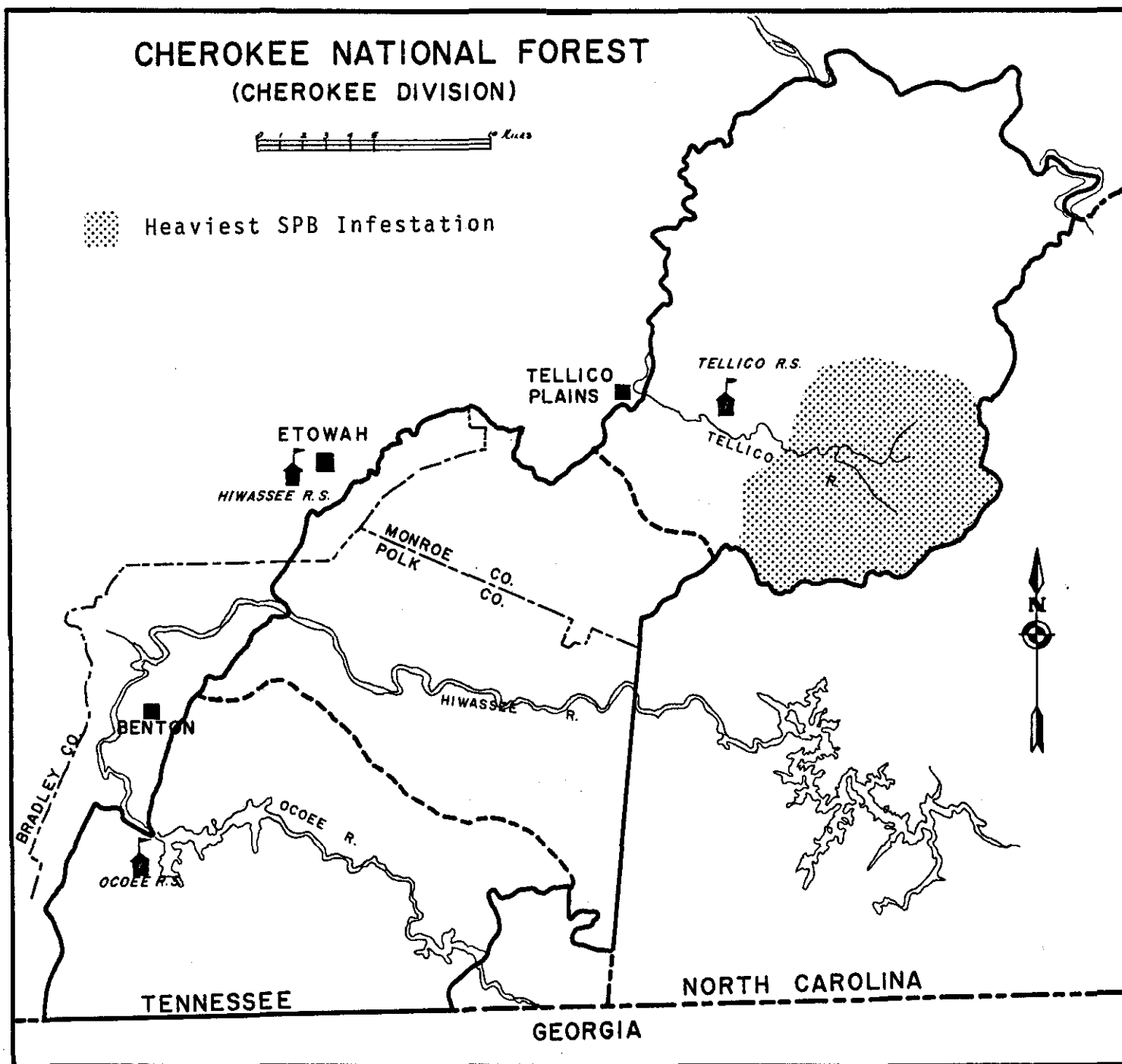
## METHODS

Standard aerial sketchmap surveys were used during this evaluation.<sup>1,2</sup> One hundred percent aerial sketchmap surveys were conducted on the three Districts. A portion of the spots detected during the aerial phases of the evaluation were examined on the ground to confirm the cause of tree mortality, the percent of spots active, the level of activity in each spot and condition of the brood.

Ground checks were conducted by personnel of Forest Insect and Disease Management Group, Asheville, North Carolina.

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- 1/ Detection of Forest Pest in the Southeast, 1970. USDA, USFS, SA, S&PF, Div. FPM, Pub. S&PF-7, Atlanta, Ga. 51 pp.
  - 2/ Evaluating Southern Pine Beetle Infestations, 1970. USDA, USFS, SA, S&PF, Div. FPM, Pub. FPM-8, Atlanta, Ga. 35 pp.

Figure 1. Location of heaviest southern pine beetle infestation on the Tellico Ranger District, Cherokee National Forest, 1976.



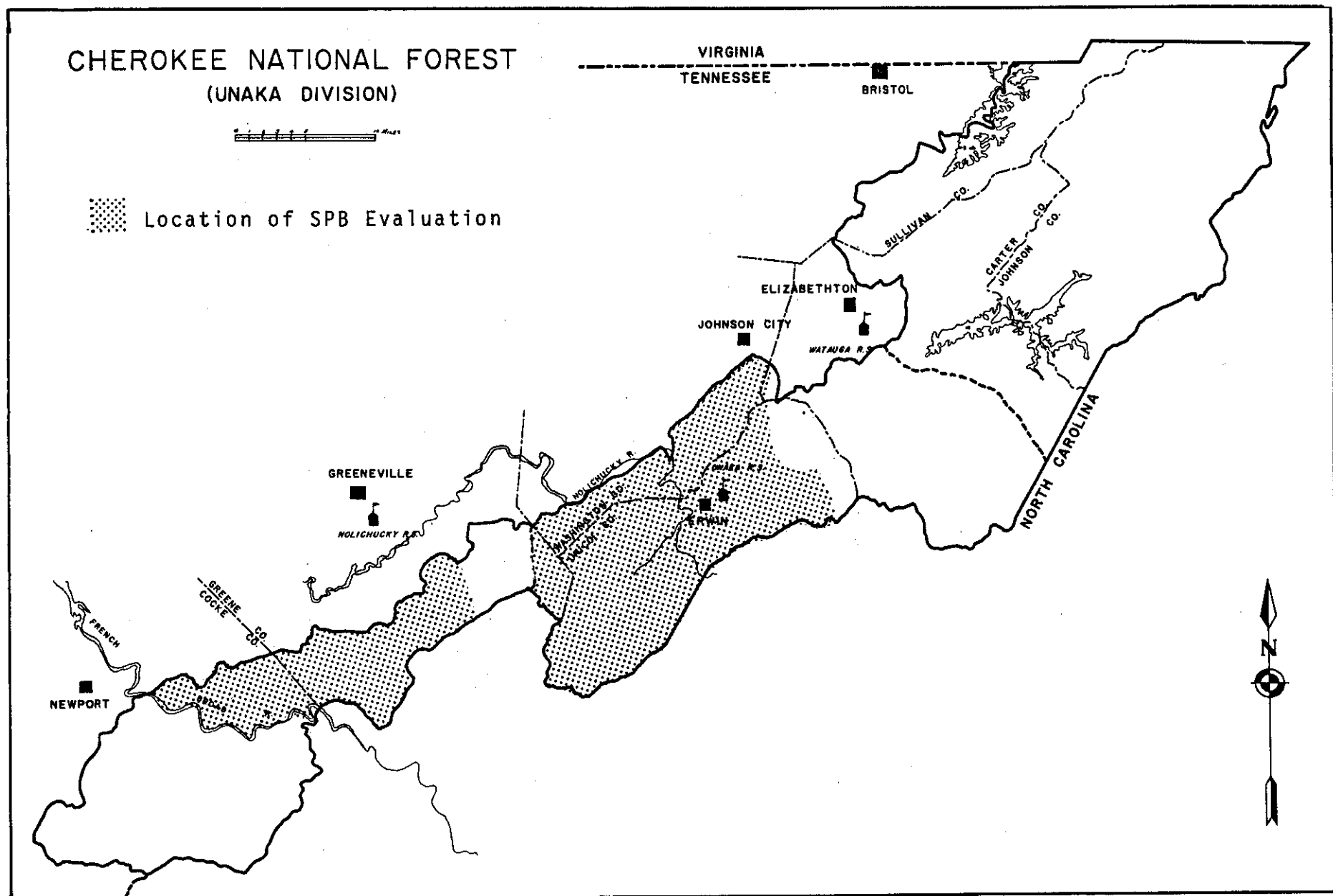


Figure 2. Location of southern pine beetle evaluation, Nolichucky and Unaka Ranger District, Cherokee National Forest, 1976.

## TECHNICAL INFORMATION

Insect - Southern pine beetle, Dendroctonus frontalis Zimm.

Host - Southern pine beetle is a native forest pest that will attack all species of southern yellow pine. Susceptible southern yellow pines successfully attacked on the Cherokee National Forest in Tennessee are Virginia (Pinus virginiana Mill), loblolly (P. taeda L.), and pitch (P. rigida Mill).

Type of Damage - Death of the tree is the result of mining in the cambium by the southern pine beetle as it constructs egg galleries. The beetle also introduces blue stain fungi, Ceratocystis spp., which slow down or block conduction of water in the stem. The size of an infestation may range from a single tree to several thousand trees.

Life Cycle of the Beetle - Southern pine beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark where they pupate and change to adults. The new adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer, and as many as four or five generations may be produced annually in the area.

## RESULTS AND DISCUSSION

Results of this evaluation indicated that the outbreak on the Tellico District has increased considerably. However, the current infestations are localized in the upper Tellico and North River drainage. The outbreak on the Nolichucky and Unaka Districts have continued at about the same level as in the summer of 1975.

Table 1 summarizes the results of this evaluation.

Data for the evaluation were stratified to only Forest Service lands and host type acreage. Data were further stratified on the Unaka and Nolichucky Ranger Districts to areas of heavy infestation where resource values were highest and accessible to salvage control operations (Fig. 2). The Cherokee National Forest salvaged 9,245 CCF of affected pulpwood, 2,778 MBF of affected sawtimber and cut, piled, and burned 18,260 infested

Table 1. Summary of results of southern pine beetle evaluations conducted on the Tellico, Nolichucky and Unaka Ranger Districts, Cherokee National Forest, Tennessee, 1976.

	Tellico Ranger District	Nolichucky Ranger District	Unaka Ranger District
1. Results compiled from data collected during the aerial phase of the evaluation:			
Survey type . . . . .	Sketchmap	Sketchmap	Sketchmap
Date of aerial survey . . . . .	8/11/76	8/5/76	8/10/76
Percent survey . . . . .	100%	100%	100%
Total acreage surveyed . . . . .	122,322	75,393	102,190
Total acreage of Forest Service land . . . . .	122,322	33,518	68,335
Susceptible host type acreage of Forest Service land . . . . .	46,177	16,500	20,429
Total number of spots within the survey boundary . . . . .	28	65	131
Total number of spots on Forest Service lands . . . . .	28	65	131
Spots per M acre of host type Forest Service lands . . . . .	.61	3.93	6.42
Average spot size (trees) Forest Service lands . . . . .	13	109	60
Range of spot sizes (trees) Forest Service lands . . . . .	2-75	1-1500	1-3000
Reds and faders/M acres host type on Forest Service lands . . . . .	7.9	429	386
2. Results compiled from data collected during the ground and aerial phases of the evaluation:			
Date of ground phase . . . . .	8/25/76	8/17/76	8/16/76
Infested trees per M acre of host type Forest Service lands . . . . .	13.0	385	609
Total number of infested trees on Forest Service lands . . . . .	600	6,351	12,442
Total volume of infested trees on Forest Service lands . . . . .	25.5 MBF	317.5 MBF	560 MBF
Total number of affected trees on Forest Service lands . . . . .	1,757	46,100	67,722
Total volume of affected trees on Forest Service lands . . . . .	74.5 MBF	2,304 MBF	3,047 MBF
Ratio of green infested to total red and fading trees . . . . .	1:1.6	1:1.95	1:1.26

Volume - BF - based on Scribner decimal C log rule. Cords converted to bd. ft. based on 500 bd. ft per cord.

trees during FY 1975. The cost of cut, piling and burning was approximately \$.50 per tree and salvage approximately \$.10 per tree.

Ground check data showed that 80 percent of the spots checked on the Tellico District were actively infested. On the Nolichucky and Unaka Districts, 100 percent of the spots checked were active.

#### RECOMMENDATIONS

Current southern pine beetle suppression efforts should be continued on the Tellico, Unaka and Nolichucky Districts of the Cherokee National Forest, Tennessee during FY 1977.

The three Ranger Districts continuing their southern pine beetle suppression projects should follow the guidelines in the 5250 sections of the FSM and the Southern Pine Beetle Control Plan for the Cherokee National Forest, Tennessee. During the current evaluation, it was evident that some Ranger Districts with control projects were not making their operational presuppression flights as often as recommended in the FSM and their control plans. This is one of the most important phases of the control package and it is recommended that these Ranger Districts make a special effort during FY 1977 to conduct their 100 percent operational aerial surveys as outlined in the guidelines.